Latin term or phrase	Abbreviation	English meaning
Sumendus	sum.	to be taken
Suppositorium	supp.	a suppository
Tabella, tabletta	tab.	a tablet
Talis, tales	tal.	such
Ter in die	t.i.d.	three times a day
Ter quotidie		three times daily

## 10 Introduction to Pharmaceutics-II

Tabella, tablettatab.a tabletTalis, talestal.suchTer in diet.i.d.three times a dayTer quotidiethree times dailyTussi urgentetuss. urg.when the cough is troublesomeUnciaan ounceUnguentumung.an ointmentUtendusu. or utend.to be usedUnusioneDuoiitwoTresiiithreeQuatuorivfourQuinquevfiveSexvisixSeptemviisevenOctoviiieightNovemixnineDecemxitenUndecimxielevenDuodecimxiitwelveQuindecimxvfifteen	Suppositorium	supp.	a suppository
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DuodecimxiitwelveQuindecimxvfifteen	Undecim	xi	eleven
Quindecim xv fifteen	Duodecim	xii	twelve
	Quindecim	xv	fifteen

### CALCULATIONS INVOLVED IN DISPENSING

Before discussing the calculations which are involved in dispensing of drugs it is very necessary to have a thorough knowledge regarding weights and measures which are used in calculations. These weights and measures are discussed as follows :

### Weight

It is a measure of the gravitational force acting on a body and is directly proportional to its mass. The mass remains constant and never varies because it is based on inertia whereas weight varies slightly with change in latitude, altitude, temperature and pressure. The effect of these factors is not considered unless very accurate weighings are to be done.

### Measure

It is the measurement of volume of any substance. Temperature and

- (b) Every two teaspoonfuls of the concentrated solution must contain these number of grains. Therefore multiply these number of grains with the number of two teaspoonfuls contained in 6 oz.
- (a) 35 gr dissolved in 8 fl. oz = 1 in 100 soln  $\frac{35 \times 100}{1000}$  gr dissolved in 8 fl. oz = 1 in 1000 soln  $\frac{35 \times 100}{1000 \times 8}$  gr dissolved in one fl. oz = 1 in 1000 soln  $\frac{35 \times 100 \times 20}{1000 \times 8}$  = 8.75 gr dissolved in 20 fl. oz = 1 in 1000 soln. Therefore, 8.75 gr of the drug must be contained in every 2 teaspoonfuls of the solution. (b)  $6 \text{ oz} = 6 \times 8 = 48$  teaspoonfuls
- 2 teaspoonfuls contain 8.75 gr

1 teaspoonful contains =  $\frac{8.75}{2}$  gr

48 teaspoonfuls must contain  $\frac{8.75}{2} \times 48 = 210$  gr.

Therefore, dissolve 210 gr of the drug in water and dilute to 6 fl oz.

Sometimes concentrated solutions may be prescribed and the pharmacist is asked to label with directions to prepare weaker percentage solutions.

Send 4 oz of a 10% solution of potassium permanganate and label 7. with directions for preparing a quart of a 1 in 400 solution.

## Calculations

These types of problems are also calculated in two parts.

- (a) Calculate the number of grains required to make 4 oz of a 10% solution.
- (b) Calculate the quantity to be diluted to a quart to make a 1 in 400 solution.
- (a) 35 gr dissolved 8 fl. oz = 1% W/V soln  $35 \times 10$  gr dissolved in 8 fl. oz = 10% W/V soln  $\frac{35 \times 10}{8}$  gr dissolved in one fl. oz = 10% W/V soln  $\frac{35 \times 10 \times 4}{g}$  = 175 gr dissolved in 4 fl. oz = 10% W/V soln. Therefore, dissolve 175 gr in water and dilute it to 4 fl. oz.
- (b) A 10% solution means 1 in  $\frac{100}{10} = 1$  in 10 soln. That is, 10 oz of the solution contains 1 oz of the substance

# Calculations

The weight of strong ammonia required =  $\frac{200 \times 4}{32.5}$  = 24.615 gm.

Therefore, dilute 24.615 gm of strong solution of ammonia to 200 gm with water. The resulting solution will contain 4% ammonia.

## **Alligation Method**

The calculations for exercises from 12 to 15 may be done by a method known as alligation method. This method is not recommended except as a method of checking because there are chances of errors in writing the figures.

 Prepare 1000 gm of dilute acetic acid 4% from 33% real acetic acid. Calculations

The weight of real acetic acid required =  $\frac{1000 \times 4}{33}$  = 121.2 gm

The amount of water required = 1000 - 121.2 = 878.8 gm.

By alligation method



Subtract 0 (for water) from 4 = 4Subtract 4 from 33 = 29

4 parts of real acetic acid and 29 parts of water will constitute 33 parts by weight of dilute acetic acid.

Therefore, the quantity of real acetic acid required

$$=\frac{1000\times4}{33}=121.2$$
 gm

and the quantity of water required =  $\frac{1000 \times 29}{33}$  = 878.8 gm.

 Prepare 400 ml of 70% alcohol from 95% alcohol. Calculations

Volume of 95% alcohol to be used =  $\frac{400 \times 70}{95}$  = 294.74 ml Volume of water to be used = 400 - 294.74 = 105.26 ml. 550 m. Out of this measure out 480 m and mix it with 480 m alcohol. Produce the final volume to 2 oz because there will be little contraction in volume which occurs when alcohol is diluted with water.

3. 1.750.

4. 70.0 gr.
6. 10.9375 gr.

- 5. 0.875 gr.
- 7. 157.5 gr.
- 9. 70 gr, 1120 gr.

- 8. 4 tablets.
- 10. 17.5 gr, 280 gr.
- 11. 109.375 gr, two tablespoonful to be diluted to a quart.
- 12. 262.5 gr, two teaspoonful to be diluted to 30 oz.
- 13. 1/8 oz or 60 minims. 14. 1/4 oz or 120 minims.

## **(B)**

- 1. Dissolve 100 mg potassium permanganate in sufficient water to produce 500 ml solution.
- 2. Dissolve 2 gm acriflavine in sufficient water to produce 100 ml solution.
- 3. Dissolve 4.5 gm sodium chloride in sufficient water to produce 500 ml solution.

9. 1.5 lit.

11. 72.72 gm.

- 4. 150 ml. 5. 231.578 ml.
- 6. 126.315 ml. 7. 105.263 ml.
- 8. 266.666 ml.
- 10. 113.636 gm.
- 12. 181.818 gm.
- (**C**)
  - 1. (i) 24° O.P. (ii) 12.07° U.P. (iii) 54.81° U.P. (iv) 40° O.P. (v) 17.07° U.P.
  - 2. (i) 82.48% V/V (ii) 67.54% V/V (iii) 77.18% V/V (iv) 14.26% V/V (v) 25.78% V/V.
  - 3. 78.88 proof gallons.

## **Revision Questions**

## I. Very short answer type questions

Answer the following questions in brief

- (i) What is prescription?
- (ii) Name various parts of a prescription?
- (iii) Why Latin language is used in prescription writing?
- (iv) What is the importance of writing the word RJ in prescription writing?